

a) brazing two transverse-flow plates to opposite faces of a thin metal platelet to make a sub-assembly;

b) coating at least a portion of the exposed surface of one side of the thin metal platelet with a combustion catalyst;

c) coating at least a portion of the exposed surface of the opposite side of the thin metal plate with a reforming catalyst;

d) cleaning the exposed surfaces of the transverse-flow plates; and

e) brazing a stack of the subassemblies to form a plate reactor.

41. A method of producing a catalytic wall plate reactor comprising the steps of:

a) brazing a metal frame to each of opposite faces of a transverse-flow plate to make a sub-assembly;

b) coating at least a portion of one side of a thin metal platelet with a combustion catalyst;

c) coating at least a portion of the opposite side of the thin metal platelet with a reforming catalyst, said bi-catalyst coated platelet forming a separator platelet; and

d) forming a stack of catalyst coated platelets interleaved with said subassemblies, including placing inert, thermally resistant gaskets between the subassemblies and separator platelets.

42. A modular reactor sub-assembly for a continuous flow plate reactor comprising in operative combination:

a) a separator platelet having a first surface and a second surface on the obverse side thereof, a longitudinal dimension terminating in first and second ends, and a lateral dimension generally orthogonal thereto terminating in first and second side edges;

b) said platelet having deposited on selected areas on at least one of said first

and said second surfaces a coating of at least one catalyst compositions, said catalyst compositions being selected from the same or different compositions;'

c) at least one first reactant gas flow plate disposed on said first side of said first separator plate;

d) at least one second reactant gas flow plate disposed on said second side of said first separator plate;

e) each of said first and second flow plates having a relieved area therein substantially corresponding to said selected catalyst composition coated area, said relieved area providing a generally planar reaction zone bounded on one side thereof by said separator platelet selected catalyst coating; and

f) said separator plate and said flow plates having aligned apertures generally located at apposed ends to provide passage of feedstock gases into and out of the respective reaction zones without short circuit and maintaining separate feed streams flow into and out of the respective zones, said gases flow in said reaction zones being selected from co-flow and counterflow.

43. A modular reactor assembly as in claim 42 wherein said catalyst composition coating on said first platelet surface is different from said catalyst composition coating on said second platelet surface.

44. A modular reactor subassembly as in claim 43 wherein at least one of said flow plate reaction zones includes means for directing gas flow into contact with said catalyst coating separator plate surface.

45. A modular reactor subassembly for a continuous flow plate reactor comprising in operative combination:

a) at least one generally planar first reactant gas flow plate having a first face and a second face on the obverse side thereof, a longitudinal dimension terminating in

first and second ends, and a lateral dimension generally orthogonal thereto terminating in first and second edges;

b) said at least one flow plate having a relieved area therein medial of said ends and edges, said area defining a generally planar reaction zone between said faces;

c) a first, generally planar separator platelet disposed on said first face of said flow plate and a second generally planar separator platelet disposed on said second face of said flow plate, said platelets defining side walls for said reaction zone;

d) said platelets each having a first surface and a second surface on the obverse side thereof; at least one of said first surfaces having deposited on selected areas a coating of at least one catalyst composition, said catalyst composition being selected from the same or different compositions and said selected areas of coating being aligned with and not extending beyond said flow plate reaction zone relieved area, and said first surfaces of said platelets on opposed faces of said flow plate facing each other with said at least one catalyst coated platelet area exposed in said reaction zone; and

e) said flow plate and said separator platelets having aligned apertures generally located at apposed ends to provide passage of feedstock gases into and out of said reaction zone.

46. A modular reactor subassembly as in claim 45 wherein both said first surfaces of said platelets are coated with the same catalyst composition.

47. A modular reactor subassembly as in claim 46 wherein both said second surfaces of said platelets are coated with the same catalyst composition, which composition is selected from the same or different catalysts as coated on said first surfaces of said platelets.